

WHAT IS CLAIMED IS:

1 1. An abrasive comprising a slurry comprising
2 a medium and cerium oxide particles dispersed in said medium
3 constituted of at least two crystallites and having crystal
4 grain boundaries.

1 2. The abrasive according to claim 1, wherein said
2 cerium oxide particles having crystal grain boundaries have
3 diameter with a middle value of from 60 nm to 1,500 nm.

1 3. The abrasive according to claim 1, wherein said
2 cerium oxide particles having crystal grain boundaries have
3 diameter with a middle value of from 100 nm to 1,200 nm.

1 4. The abrasive according to claim 1, wherein said
2 cerium oxide particles having crystal grain boundaries have
3 diameter with a middle value of from 300 nm to 1,000 nm.

1 5. The abrasive according to any one of claims 1 to
2 4, wherein said crystallites have diameter with a middle
3 value of from 5 nm to 250 nm.

1 6. The abrasive according to any one of claims 1 to
2 4, wherein said crystallites have diameter with a middle
3 value of from 5 nm to 150 nm.

1 7. The abrasive according to claim 4, wherein said
2 crystallites have diameter with a middle value of from 10 nm
3 to 50 nm.

1 8. The abrasive according to claim 4, wherein said
2 crystallites have diameter with a middle value of from 50 nm
3 to 200 nm.

1 9. The cerium oxide abrasive according to any one of
2 claims 1 to 8, wherein said cerium oxide particles having
3 crystal grain boundaries have a maximum diameter not larger
4 than 3,000 nm.

1 10. The cerium oxide abrasive according to any one
2 of claims 1 to 9, wherein said crystallites have a maximum
3 diameter not larger than 600 nm.

1 11. An abrasive comprising a slurry comprising a
2 medium and abrasive grains having pores which are dispersed
3 in said medium.

1 12. The abrasive according to claim 11, wherein said
2 abrasive grains have a porosity of from 10% to 30% as
3 determined from the ratio of a true density measured with a
4 pycnometer to a theoretical density determined by X-ray
5 Rietveld analysis.

1 13. The abrasive according to claim 11 or 12,
2 wherein said abrasive grains have a pore volume of from 0.02
3 cm³/g to 0.05 cm³/g as measured by the B.J.H. method.

1 14. The abrasive according to any one of claims 11
2 to 13, wherein said abrasive grains are cerium oxide
3 particles.

1 15. An abrasive comprising a slurry comprising a
2 medium and dispersed therein cerium oxide particles having a
3 bulk density not higher than 6.5 g/cm³.

1 16. The abrasive according to claim 15, wherein
2 said bulk density is from 5.0 g/cm³ to 5.9 g/cm³.

1 17. The cerium oxide abrasive according to any one
2 of claims 1 to 16, wherein said medium is water.

1 18. The cerium oxide abrasive according to any one
2 of claims 1 to 17, wherein said slurry contains a
3 dispersant.

1 19. The cerium oxide abrasive according to claim 18,
2 wherein said dispersant is at least one selected from a
3 water-soluble organic polymer, a water-soluble anionic
4 surfactant, a water-soluble nonionic surfactant and a

5 water-soluble amine.

1 20. The cerium oxide abrasive according to claim 19,
2 wherein said dispersant is a polyacrylic acid type polymer.

1 21. The abrasive according to claim 1, wherein;
2 cerium oxide particles with a diameter not smaller
3 than 1 μm occupies at least 0.1% by weight of the total
4 weight of the cerium oxide particles; and
5 said cerium oxide particles having crystal grain
6 boundaries have the nature of polishing a target member
7 while collapsing.

1 22. The abrasive according to claim 1, wherein said
2 cerium oxide particles having crystal grain boundaries have
3 the nature of polishing a target member while forming new
4 surfaces not coming into contact with any medium.

1 23. The abrasive according to claim 1, wherein the
2 content of cerium oxide particles having a particle diameter
3 not smaller than 0.5 μm after polishing, measured by
4 centrifugal sedimentation after a target member has been
5 polished, is in a ratio of not more than 0.8 with respect to
6 that content before polishing.

1 24. The abrasive according to claim 1, wherein

2 cerium oxide particle diameter at D99% by volume measured by
3 laser diffraction after a target member has been polished is
4 in a ratio of from 0.4 to 0.9 with respect to that particle
5 diameter before polishing.

1 25. The abrasive according to claim 1, wherein
2 cerium oxide particle diameter at D90% by volume measured by
3 laser diffraction after a target member has been polished is
4 in a ratio of from 0.7 to 0.95 with respect to that particle
5 diameter before polishing.

1 26. A method of polishing a target member,
2 comprising polishing a target member by the use of the
3 abrasive according to any one of claims 1 to 25.

1 27. The method of polishing a target member
2 according to claim 26, wherein said target member has a
3 strength higher than the grain boundary breaking strength of
4 the cerium oxide particles.

1 28. The method of polishing a target member
2 according to claim 26, wherein said target member is a
3 semiconductor chip on which a silica film has been formed.

1 29. A process for producing a semiconductor device,
2 comprising the step of polishing a semiconductor chip on

3 which a silica film has been formed, by the use of the
4 abrasive according to any one of claims 1 to 25.